What is claimed is:

1. A process for preparing a structure comprising carbon nanotubes, said process comprising:

a step of melt flowing a first composition comprising a core polymer through a spinneret to align molecules of the core polymer to be in a substantially parallel arrangement,

a step of combining a second composition comprising a sheath polymer in the melt phase and carbon nanotubes with the flow of the first composition thereby aligning the carbon nanotubes to be in the general direction of the core polymer molecules, and

a step of removing at least 50% by weight of the core and sheath polymer molecules.

2. The process according to claim 1, wherein the core polymer and the sheath polymer have backbones comprising at least one identical type of structural unit.

3. The process according to claim 2, wherein the at least one identical type of structural unit is selected from the group consisting of an alkylene, alkene, alkyne, amide, ether, urethane, siloxane, silane, urea, carbonyl and carboxyl.

4. The process according to claim 1, wherein the core and sheath polymers are removed by heat treatment.

5. The process according to claim 1, wherein the carbon nanotubes in the structure are aligned to give an f value of 0.590 – 1.00.

6. The process according to claim 1, wherein both the core and the sheath polymers wet the carbon nanotubes during the flow step.

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7. The process according to claim 1, wherein the core and sheath polymers have a melting temperature (T_m) of greater than 50° C and a weight average molecular weight of at least 10,000.

8. The process according to claim 7, wherein the core and the sheath polymers have a T_m in a range of 50-300°C and a weight average molecular weight in a range of 10,000-2,000,000.

9. The process according to claim 1, wherein the core polymer and sheath polymer may be the same or different and are a homo- or co-polymer of at least one selected from the group consisting of polyolefin, polyurethane, polysiloxane, polyacrylate, polyalkylacrylate, polymethacrylate, polyalkyl methacrylate, polyamide, polyoxymethylene, polyester, polyesteramide, polyether and polyetheramide.

10. The process according to claim 5, wherein the core and the sheath polymers are removed leaving hollow macrotubes having walls composed of carbon nanotubes.

11. The process according to claim 1, wherein the carbon nanotubes in the second composition are in a concentration of greater than 9 wt% based on the weight of the second composition.

12. The process according to claim 10, wherein the concentration of the carbon nanotubes in the second composition is 25-50 wt% based on the weight of the second composition.

13. The process according to claim 1, further comprising a step of densifying the structure by depositing carbon, silicon or silicon carbide.

14. A structure comprising carbon nanotubes wherein the carbon nanotubes in the structure are aligned to give an f value of 0.590 – 1.00.

15. The structure according to claim 14, wherein the carbon nanotubes in the structure are aligned to give an f value of 0.630 – 0.900.

16. The structure according to claim 14, wherein the carbon nanotubes in the structure are aligned to give an f value of 0.630-0.750.

17. The structure according to claim 14, wherein at least one of carbon, silicon and silicon carbide has been deposited on the carbon nanotubes.

18. The structure according to claim 15, wherein the structure is a hollow macrotube comprising walls made of the carbon nanotubes.

19. The structure according to claim 15, wherein the structure is an essentially flat film formed of the carbon nanotubes.

20. A friction material for braking systems comprising the structure according to claim 14.

21. An apparatus for preparing a structure comprising aligned carbon nanotubes according to claim 14, said apparatus comprising an upper spinneret having inner walls defining a cavity (A) through which a core polymer flows, a lower spinneret having inner walls defining a cavity (B) which is aligned with the cavity (A) so that the core polymer flowing from the upper spinneret flows directly into the cavity (B), the lower spinneret having an upper surface which is indented to form at least one cavity (C) for a mixture comprising a sheath polymer and carbon nanotubes, wherein the cavity (C) is defined by an inner wall, bottom wall and outer wall, the lower spinneret containing at least one annular space which connects cavity (C) with cavity (B) to allow flow of the sheath polymer/carbon nanotube mixture from cavity (C) to cavity (B) to coat the core polymer to form a carbon nanotube coated polymer mixture, the inner walls defining cavity (B) constrict at a constricting point to reduce the diameter of cavity (B) to a distance D_i thereby increasing the shear force on the

carbon nanotube coated polymer mixture before exiting the apparatus through an exit hole in the lower spinneret.

22. The apparatus according to claim 21, wherein multiple cavities (C) are concentrically located around cavity (B) and are each connected to cavity (B) with at least one annular space.

23. The apparatus according to claim 21, wherein cavity (C) is a single cavity concentrically located around cavity (B).

24. The apparatus according to claim 22, wherein a line D_o is a measurement of an average of twice the distance between the inner wall of cavity (C) and a center point of cavity (B), wherein the line D_o is measured at an angle which is perpendicular to the flow of the core polymer through cavity (B), and wherein the ratio D_o/D_i is 4-25.

25. The apparatus according to claim 23, wherein the cavity (C) is a single concentric cavity which is connected to cavity (B) by multiple annular spaces, a line D_o is a measure of the diameter of the inner wall, and the ratio D_o/D_i is 4-25.

26. The apparatus according to claim 24, wherein the ratio D_o/D_i is 6-10.

27. The apparatus according to claim 25, wherein the ratio D_o/D_i is 6-10.

28. The apparatus according to claim 21, wherein the structure contains 2-30 capillaries.